

WHAT IS CLAIMED IS:

1           1. A cylindrical or truncated conical annular element or liner, in  
2 particular of plastic, for constructing a channel or pipe-cased shaft or a pipeline, whereby  
3 aligned longitudinal ribs (3) are provided on the outer surface (5) of the annular element (1),  
4 in particular, parallel to the generatrix and/or parallel to the central median axis (7) of the  
5 annular element (1), characterized in that at least two longitudinal ribs (3), lying side by side,  
6 having an essentially parallel direction of projection, extend from the outer surface (5).

1           2. The annular element according to claim 1, characterized in that the  
2 lateral surfaces of at least two side-by-side longitudinal ribs (3) which have an essentially  
3 rectangular or at least partially rectangular cross section, are essentially and at least partially  
4 aligned in parallel, whereby the surface of the longitudinal ribs (3) facing the annular element  
5 (1) is adapted to the curvature of the outer surface (5).

1           3. The annular element according to either claim 1 or 2, characterized in  
2 that at least one longitudinal rib (3) has a radial direction of projection.

1           4. The annular element according to any one of the claims 1 to 3,  
2 characterized in that the longitudinal ribs (3) are arranged at regular distances from one  
3 another.

1           5. The annular element according to any one of the claims 1 to 4,  
2 characterized in that transverse ribs (2) which are aligned in peripheral direction and extend  
3 parallel to one another, in particular crossing the longitudinal ribs (3), in particular  
4 continuous, are provided on the outer surface (5).

1           6. The annular element according to any one of the claims 1 to 5,  
2 characterized in that the annular element (1) is assembled, in particular screwed, glued or  
3 welded together, in particular in a watertight manner, from several, in particular 2, 3, 4, 6, 8  
4 or 10, partially cylindrical or partially truncated conical annular segments (10), in particular  
5 of the same dimensions.

1           7. The annular element according to claim 6, characterized in that the  
2 longitudinal ribs (3) are constructed mutually identical.

1                   8.        The annular element according to either claim 6 or 7, characterized in  
2 that all longitudinal ribs (3) of an annular segment (10) extend from the outer surface (5) with  
3 an essentially parallel direction of projection.

1                   9.        The annular element according to any one of the claims 6 to 8,  
2 characterized in that the lateral surfaces of all longitudinal ribs (3) of an annular segment (10)  
3 which are, in particular, essentially rectangular or at least partially rectangular in cross  
4 section are aligned essentially parallel to one another.

1                   10.      The annular element according to any one of the claims 6 to 9,  
2 characterized in that each annular segment (10) has a longitudinal rib (3) with a radial  
3 direction of projection.

1                   11.      The annular element according to any one of the claims 6 to 10,  
2 characterized in that each annular segment (10) has at least one longitudinal rib (3) which  
3 extends parallel to the angular symmetrical plane (20) of the central angle ( $\alpha$ ) of the annular  
4 segment (10) extending through the median axis (7).

1                   12.      The annular element according to any one of the claims 6 to 11,  
2 characterized in that the longitudinal ribs (3) of each annular segment (10) are arranged at  
3 regular distances from one another, preferably symmetrically to the angular symmetrical  
4 plane (20).

1                   13.      The annular element according to any one of the claims 6 to 12,  
2 characterized in that a longitudinal rib (3) of each annular segment (10) lies on the angular  
3 symmetrical plane (20).

1                   14.      The annular element according to any one of the claims 6 to 13,  
2 characterized in that each annular segment (10) has radially outward and/or inward projecting  
3 broad flange surfaces (16) on its straight broad sides (15) via which the annular segments  
4 (10) can be connected to one another, in particular in a watertight manner, to form an annular  
5 element (1).

1                   15.      The annular element according to any one of the claims 6 to 14,  
2 characterized in that the annular element (1) or each annular segment (10) has on its curved  
3 longitudinal sides (17) normal to the median axis or axis of curvature (7), outwardly and/or

4 inwardly projecting longitudinal surfaces of the flange (18) via which the annular element (1)  
5 can be connected to further annular elements (1), in particular in a watertight manner, to form  
6 a pipe-cased shaft or the like.

1 16. The annular element according to claim 14 or 15, characterized in that  
2 recesses (21) for fastening means are provided in the broad surfaces (16) of the flange and/or  
3 the longitudinal surfaces (18) of the flange.

1 17. The annular element according to any one of the claims 6 to 16,  
2 characterized in that, in particular, continuous transverse ribs (2) are provided on each  
3 annular segment (10) on the outer surface (5) extending in peripheral direction and parallel to  
4 one another, in particular crossing the longitudinal ribs (3).

1 18. The annular element according to any one of the claims 1 to 17,  
2 characterized in that the longitudinal ribs (3) are continuous.

1 19. The annular element according to any one of the claims 1 to 18,  
2 characterized in that the annular element (1) and/or the individual annular segments (10) are  
3 made as one-piece shaped parts.

1 20. The annular element according to any one of the claims 1 to 19,  
2 characterized in that the annular element (1) and/or the individual annular segments (10)  
3 and/or the shaft constructed from annular elements (1) are surrounded, at least partially, on  
4 the outside (5) by a concrete layer.

1 21. The annular element according to any one of the claims 1 to 20,  
2 characterized in that at least one groove (16', 18') is made in the longitudinal surface (16)  
3 and/or in the broad surface (18) of the flange for accommodating seals (16'', 18'') with which  
4 adjacent broad surfaces (16) or longitudinal surfaces (18) of the flanges can be sealed.

1 22. A shaft, in particular a channel shafts or pipe-cased shaft, constructed  
2 of annular elements according to any one of the claims 1 to 21.